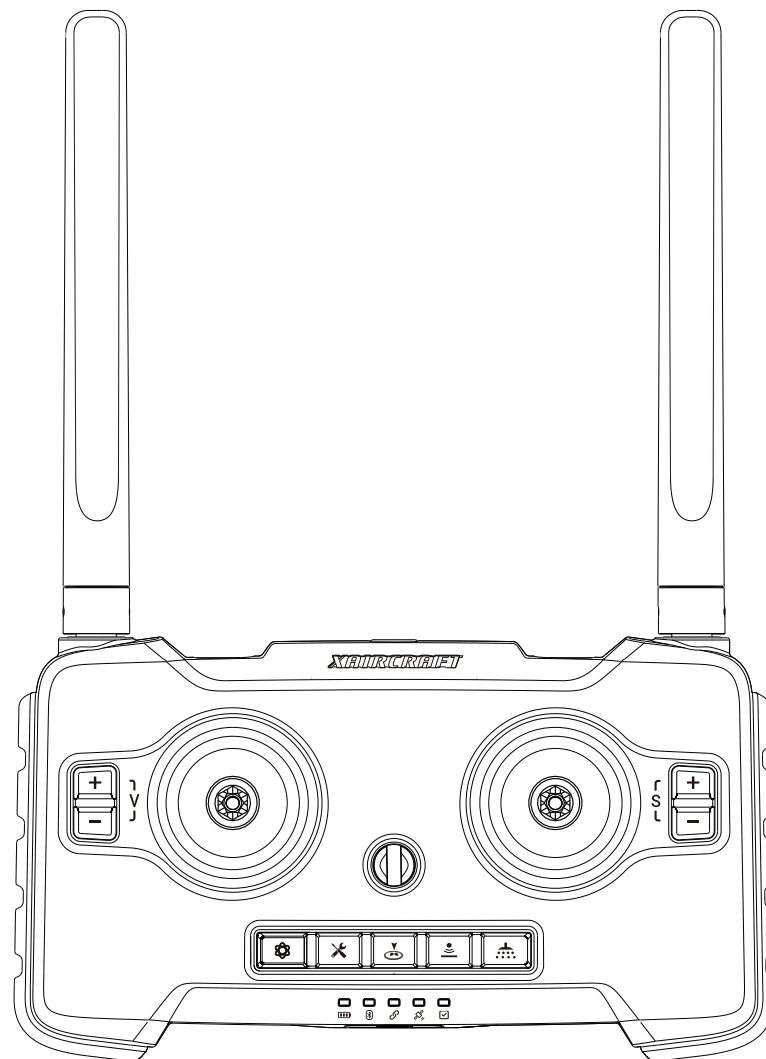


XAG Agricultural Remote Controller

ARC1 V1.3

User Manual

2019.02



Searching for Keywords

Search for keywords in this User Manual.

Navigating to a Topic

View a complete list of topics in the table of contents. Click on a topic to navigate to that section.

Printing this Document

This document supports high resolution printing

Using this Manual

Legends



Warning



Important



Hints & Tips

Before Flight

User Manual have been produced to help operators make full use of the XAG P-Series Plant Protection UAV

Watching all the tutorial videos is recommended. Afterwards, prepare for your first flight following the instruction. Refer to this Manual for more comprehensive information.

Watch the video tutorials

Please watch the tutorial video below to learn how to use XAG ARC1 Agricultural Remote Controller correctly and safely

<http://>

Subscribe to our Channel for Future Videos

Download the XAG APP

Be sure to use A2 Pilot phone to download the necessary APP to operate XAG ARC1 Agricultural Remote Controller

- XPilot APP

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Product Profile

This chapter describes the features of the XAG ARC1 Manual Remote Controller, contains the diagrams of the Remote Controller with component explanations

Product Profile

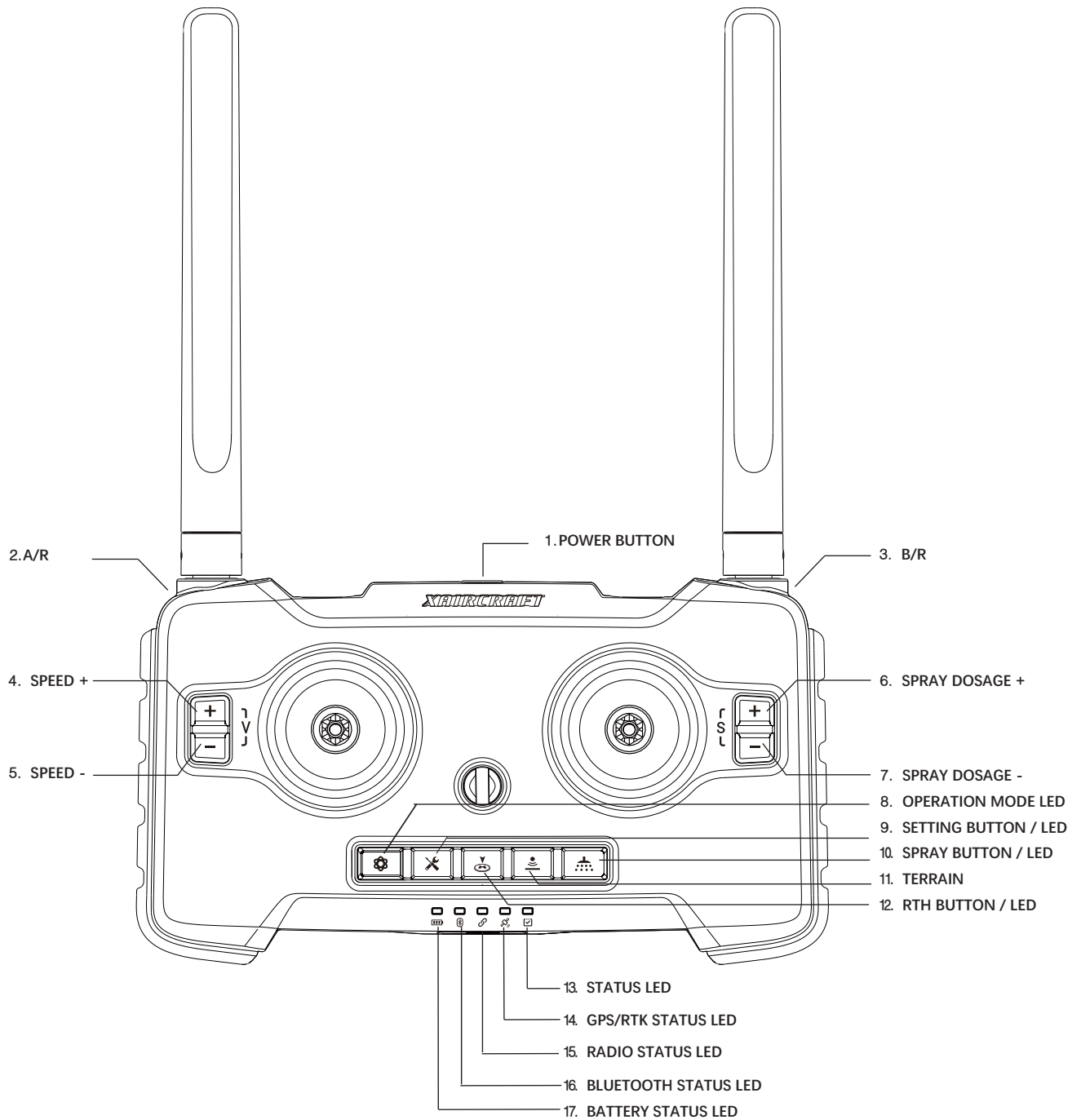
Introduction

XAG ARC1 Agricultural Remote Controller was designed specifically to provide manual control for XAG Plant Protection UASs. The ARC1 is light and portable. It is dust and water proof, able to withstand rough handling and adverse weather conditions. It is battery powered and chargeable via USB connection.

The ARC1 comprises with two telecommunication antennas to provide a reliable and continuous communication with the UASs, ensuring safe Operation.

Intelligent AB mode and SAPM (Spray Area Pixel Memory) function minimize overlapping or miss spraying during the operation.

Voice Notifications allows the operator to be kept inform while keeping in sight of the aircraft while airborne.



1. Power Button	Power ON/OFF the remote controller Press and Hold the power button for 3 seconds, all the status LED will blink. Release and HOLD the power button to turn ON/OFF the controller.
2. A/L button	Record Point A / Shift left to the next ridge
3. B/R button	Record B point / Shift right to the next ridge
4. Speed +	Increase maximum manual speed / route speed
5. Speed –	Decrease maximum manual speed / route speed
6. Spray Amount +	Increase spray amount (in Mu)
7. Spray Amount –	Decrease spray amount (in Mu)
8. Operation Mode button/LED	Switch to intelligent mode, display in intelligent mode or not
9. Settings button/LED	Press to enter Dynamic adjustment UAV Pairing Process: Press and Hold for 6 seconds Control Stick Calibration: Adjust both control sticks to bottom left corner, then Press and Hold for 2 seconds
10. Spray Button/LED	Spray system ON/OFF
11. Terrain mode Button/LED	Terrain mode ON/OFF
12. RTH (Return to Home) Button /LED	Press and hold to initiate Return to Home (RTH) Press again to cancel RTH, and Hover UAV During RTH, any maneuvers on the control stick will stop the RTH and enters manual mode
13. Status LED	Indicates the status of readiness of the aircraft
14. GPS/RTK Status LED	Indicates the GPS/RTK connectivity Status Slow Flash - Single mode Quick flash - Float mode Constant light - RTK mode

15. Radio Status LED

Indicates connection status,
Solid light- Good connection,
Flashing – Poor connection,
No light – No connection

16. Bluetooth Status LED

Indicates the linking status with XPilot App

17. Battery Status LED

Indicates the Battery Level

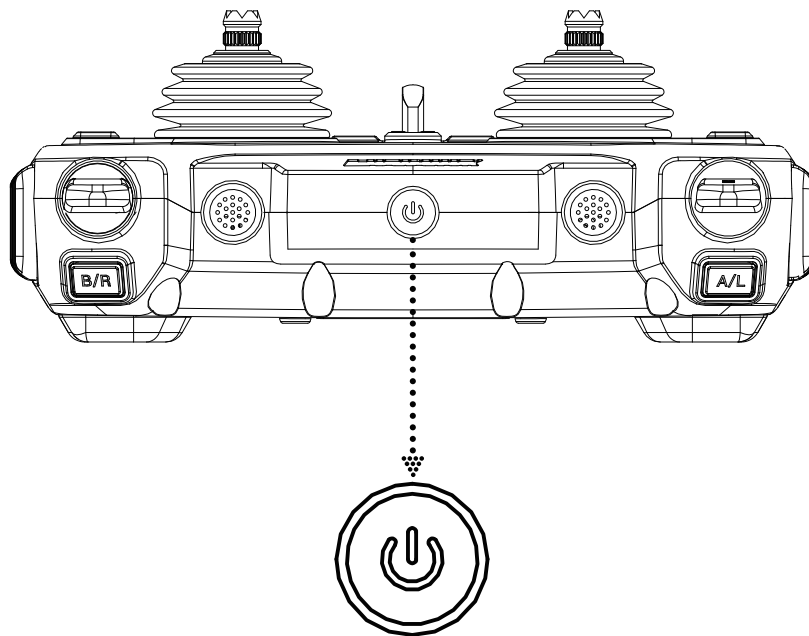
LED Indicator	Battery Level
Green Solid	75% - 100%
Yellow Flashing	25% - 75%
Red Solid	5% - 25%
Red Flashing	0% - 5%

ARC1 Agricultural Remote Controller Operations

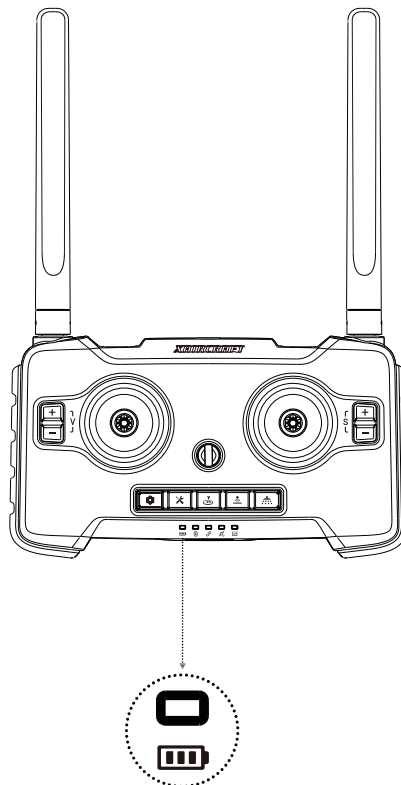
Turning the Remote Controller ON and OFF

Follow the steps below to turn the remote controller on and off

1. Press and Hold the power button for 2 seconds, all the status LED will blink
2. Release and HOLD the power button for 2 seconds to POWER ON
3. Repeat Step 1 – 2 to power off the remote controller



Battery Status LED Indicators Description



The battery level indicators display the battery level of the controller. The status LED displays the battery levels and the charging status.

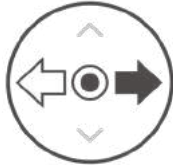
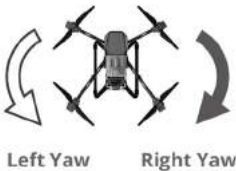
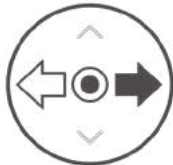
Battery Level Indicators	Status LED	Description
(G) _____	Green LED Solid	75% - 100%
(Y) _____	Yellow LED Solid	25% - 75%
(R) _____	RED LED Solid	5% - 25%
(R).....(R).....(R).....	RED Flashing	0% - 5%

Battery Charging Indicators	Status LED	Description
(B).....(B).....(B).....	Blue Quick Flash	Quick Charging
(B).....(B).....	Blue Slow Flash	Slow Charging
(B) _____	Blue LED Solid	Full Charge

Controlling the Aircraft

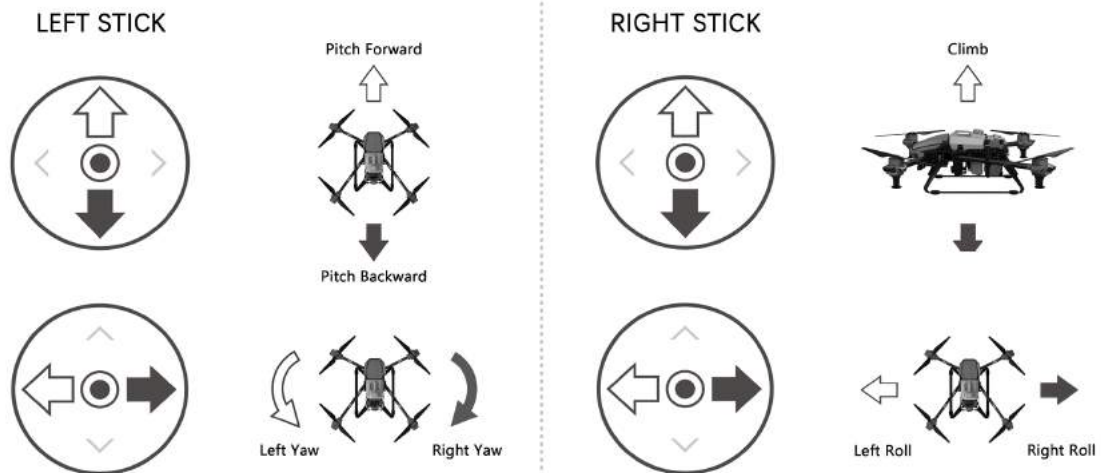
XAG ARC1 Remote Controller's provides manual control to the aircraft's orientation (Yaw), forward and backward movement (Pitch), altitude (Climb & Decent), and left and right movement (Roll). There are three preprogrammed modes (Mode 1, Mode 2, Mode 3) available and can be configured in XAG XPilot APP. The default mode is Mode 1.

In each of the three pre-programmed modes, the aircraft hovers at the same location when both sticks are centered. Please follow instruction in Manual Remote Controller Calibration for User Calibration. Model 1 is the Default Mode for XAG ARC1, and has been used as an example to explain how each control stick operates the aircraft explains in figure below.

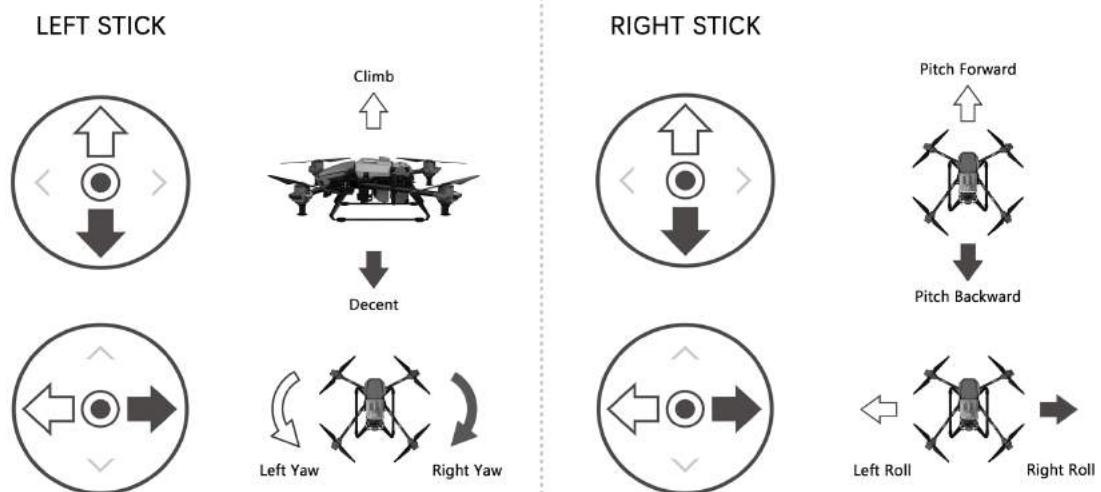
Mode 1 Control	Aircraft	Notes
Left Stick 		Left Control Stick (Vertical Movement) controls the Aircraft's Pitch. Push: Command the Aircraft to PITCH FORWARD Pull: Command the Aircraft to PITCH BACKWARD
Left Stick 		Left Control Stick (Horizontal Movement) controls the Aircraft's Orientation. Left: Rotate the Aircraft COUNTER-CLOCKWISE (CCW) Right: Rotate the Aircraft CLOCKWISE (CW)
Right Stick 		Right Control Stick (Vertical Movement) controls the Aircraft's Altitude. Push: Command the Aircraft to CLIMB Pull: Command the Aircraft to DECENT
Right Stick 		Right Control Stick (Horizontal Movement) controls the Aircraft's Roll. Left: Command the Aircraft to Roll LEFT Right: Command the Aircraft to Roll RIGHT

Figures below display the function of each control stick in the three preprogrammed modes.

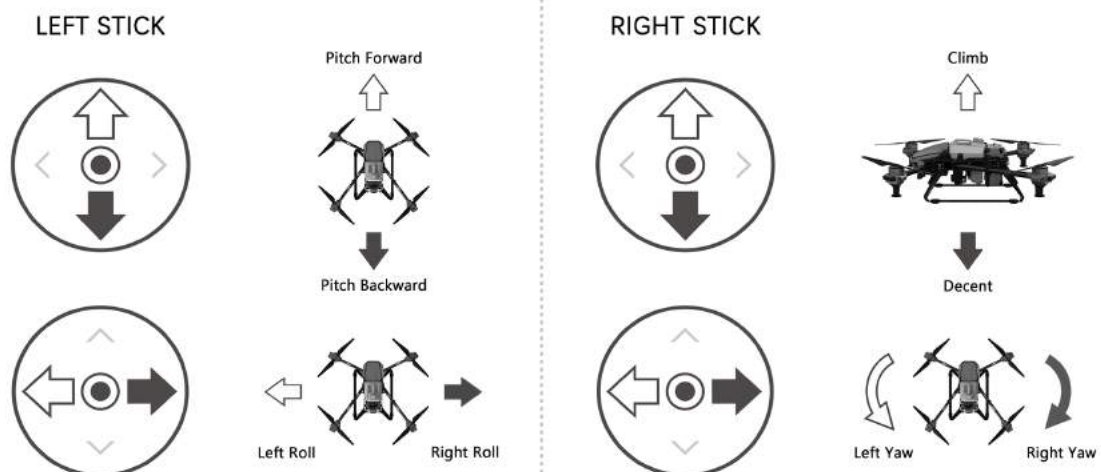
MODE-1



MODE-2

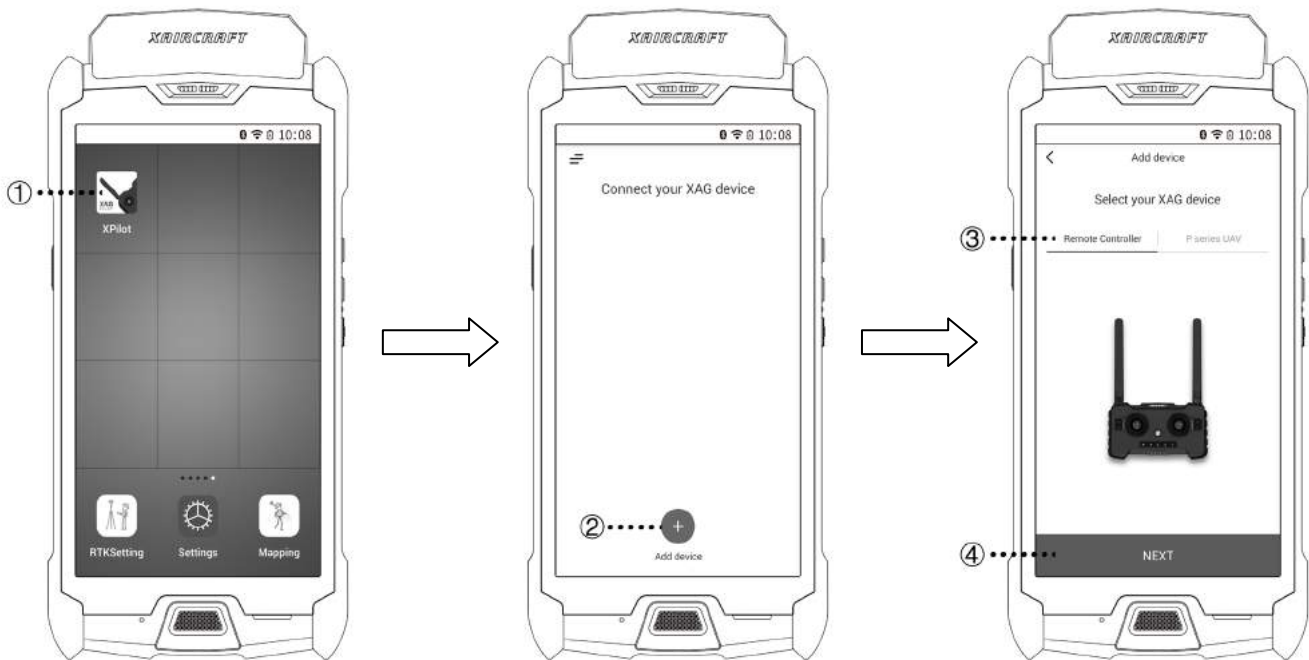


MODE-3

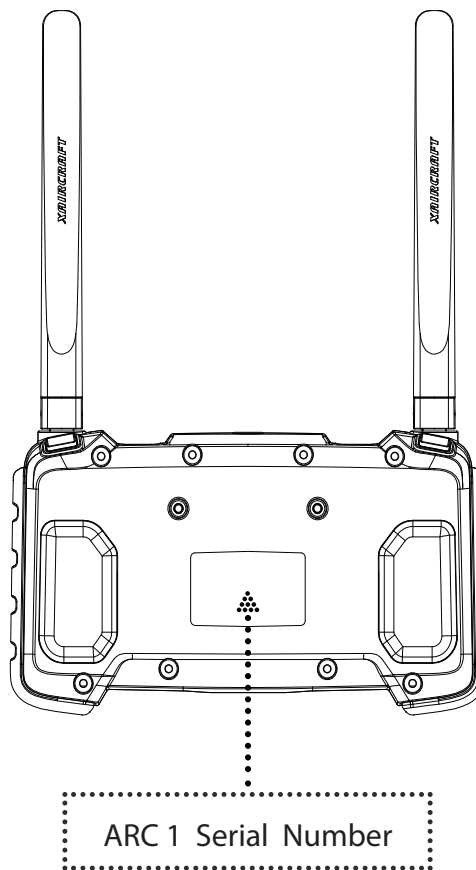


Pairing the Remote Controller

XAG ARC1 Agricultural Remote Controller needs to be paired before use. Follow the steps below to pair the remote controller to the A2 Pilot Phone.



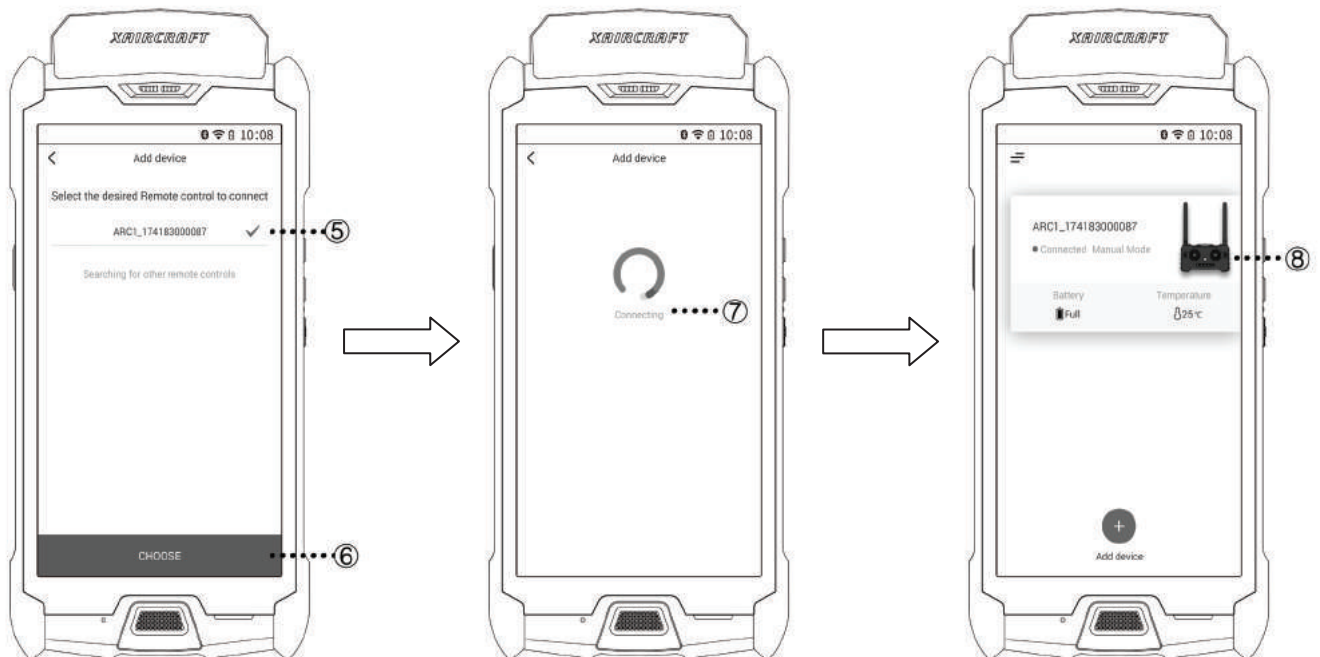
1. Turn ON the ARC1 Agricultural Remote Controller and open XAG XPilot APP on A2 Pilot Phone
2. Select Add Device
3. Select the Remote Controller
4. Select Next to Proceed



5. A2 Pilot Phone will automatically detect any active ARC1 around and will display the ARC1's Serial Number

ARC1 Serial Number is located at the back of the ARC1

6. Select the desired Remote Controller to connect
7. Please be patient and allow the A2 Pilot Phone to complete the pairing process with the ARC1
8. ARC1 is now connected to the A2 Pilot Phone

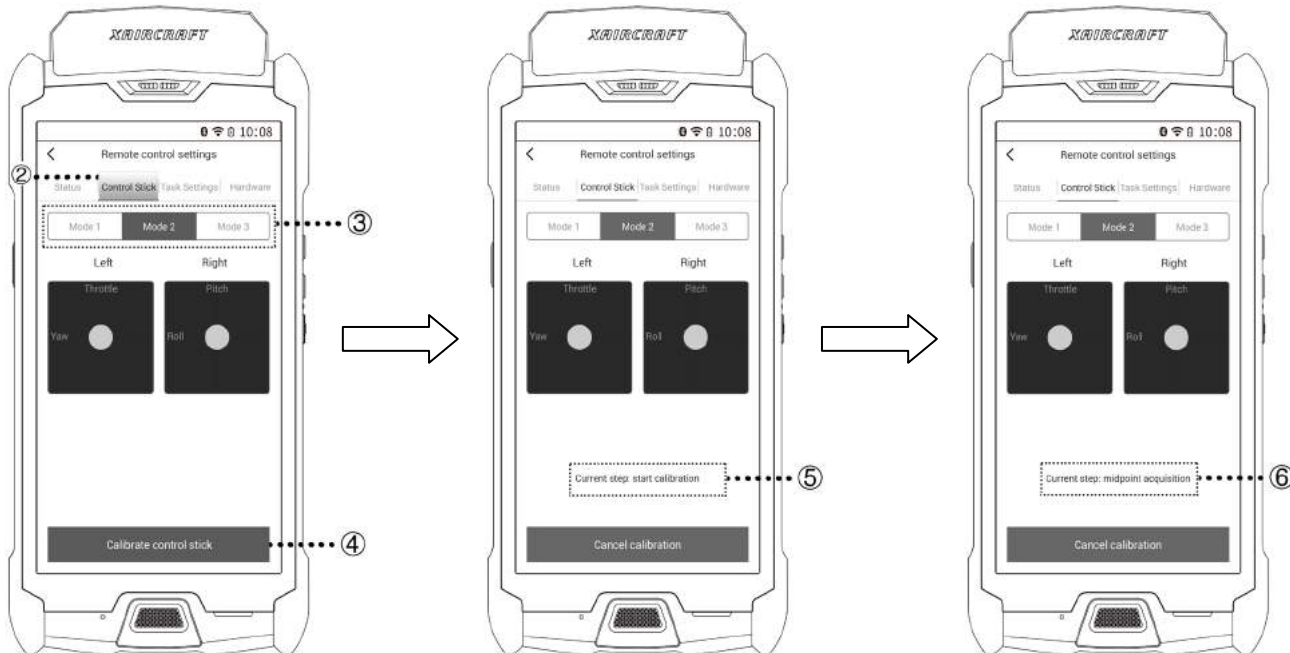
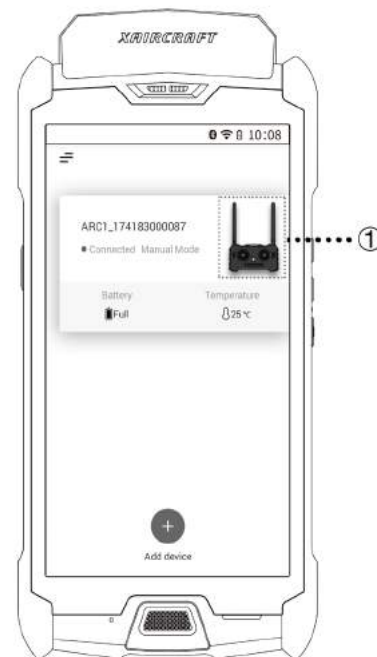


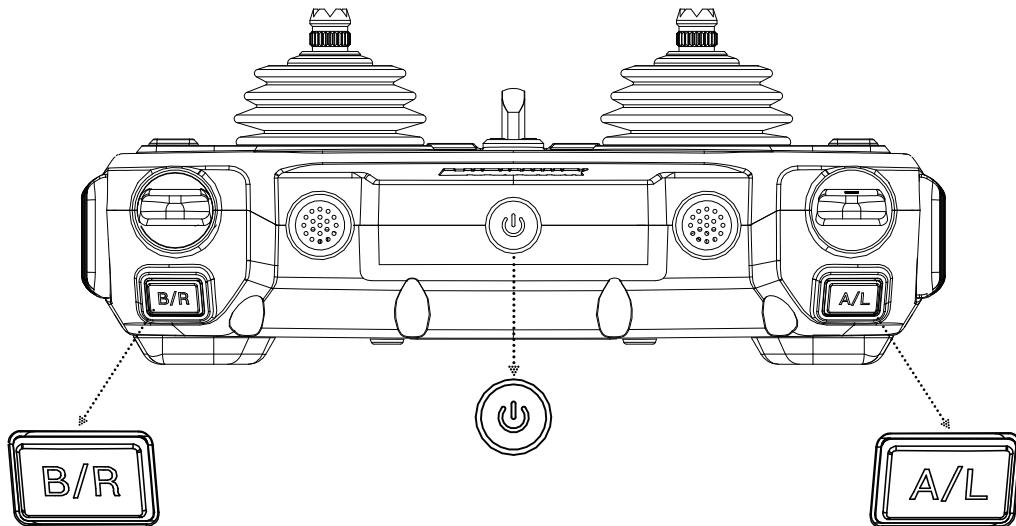
Manual Remote Controller Calibration

There are three pre-programmed mode on the ARC1 Manual Remote Controller. XAG recommends its user to calibrate their Remote Controller on a frequent basis to ensure safe operation.

Follow the diagrams and steps listed below to calibrate the remote controller with an A2 Pilot Phone

1. Select the ARC1 Icon to Enter the settings Page
2. Select "Control Stick" to enter the Mode Selection Page
3. Select "Calibrate Control Stick" to begin Calibration
4. Follow the steps indicated on the screen, and proceed to the next step of the calibration process by pressing button A/L or B/R on the ARC1
5. Midpoint Acquisition Calibration: This step requires no maneuvers, but ensures that both control sticks are centre by nature and no forces are applied to the controls.
Press A/L or B/R on the ARC1 Remote Controller to proceed to next step





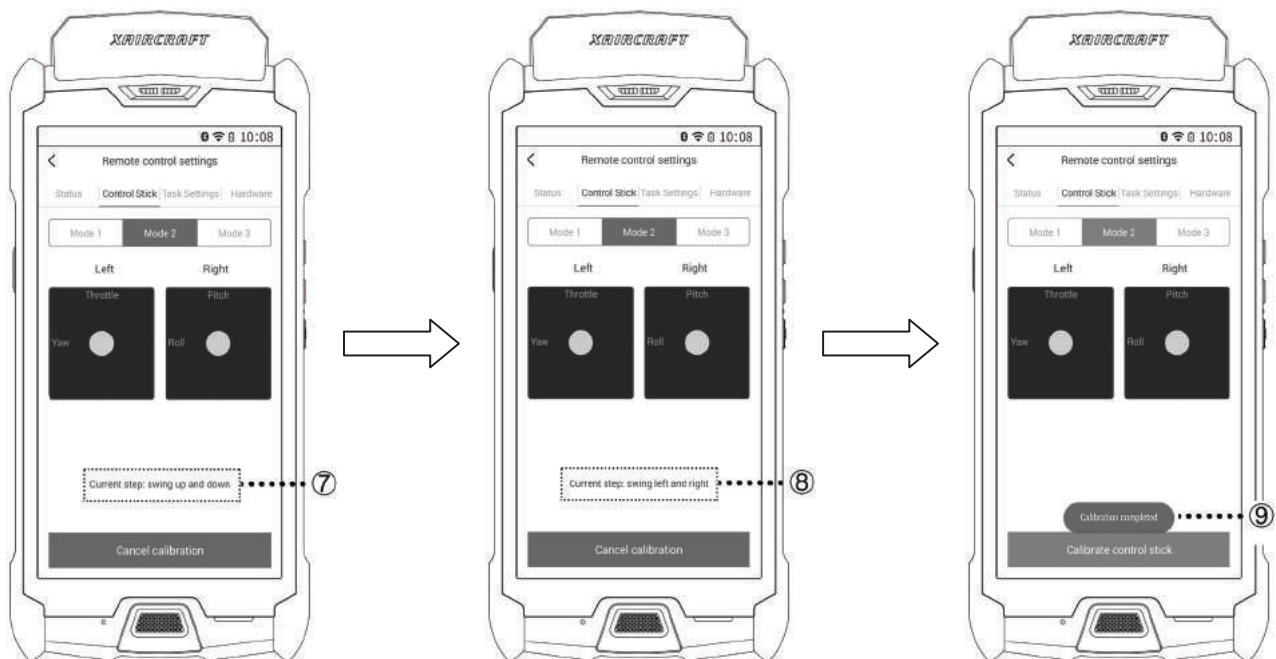
6. Swing Up and Down: While monitoring the movement on the A2 Pilot Phone, move both the control sticks up and down. A2 should display a direct shadow movement according to your control inputs.

Press A/L or B/R on the ARC1 Remote Controller to proceed to next step

7. Swing Left and Right: While monitoring the movement on the A2 Pilot Phone, move both the control sticks left and right. A2 should display a direct shadow movement according to your control inputs.

Press A/L or B/R on the ARC1 Remote Controller to proceed to next step

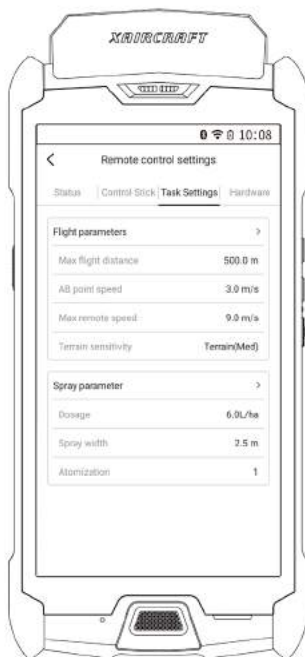
8. A Notification will display on the A2 Pilot Phone notifying once the calibration process is completed.



Parameters Setting

Prior to beginning any spraying operations, it is crucial for the operators to preset the flight and spray parameters. These settings will affect the efficiency and effectiveness of the spray operation, XAG recommends operators to adjust the setting suitable based on each scenario

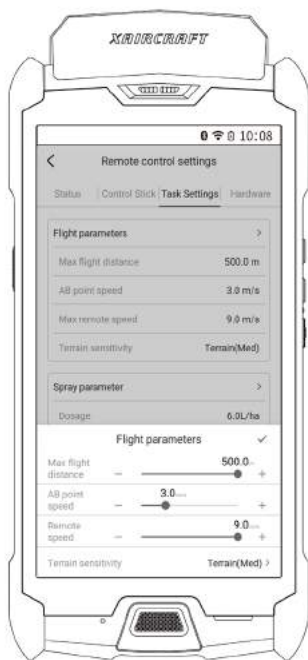
 Preset the Parameters by selecting the ARC1 Icon.



Task Settings

This interface provides basic information about the settings of the Flight and spray Parameters.

 Click on the Flight Parameters or Spray Parameter to adjust the settings.



Flight Parameters

Open Flight Parameters and confirm:

1. Max Flight Distance

This refers to the maximum distance the aircraft can travel away from the ARC1 Remote Controller (Limited due to VLOS)

2. AB Point Speed

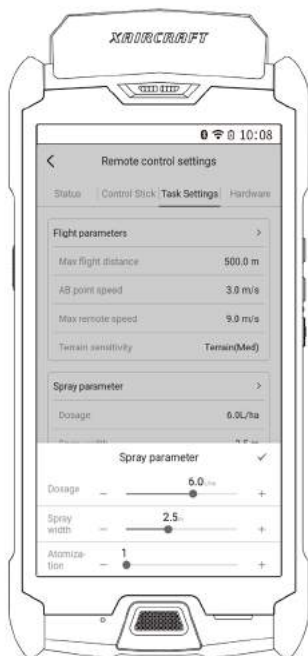
Maximum Speed of the aircraft while operating in Intelligence AB Mode Operation.

3. Remote Speed

Maximum speed of the aircraft (9m/s) , this refers to the speed that the aircraft will travel while controlled by Remote Controller

4. Terrain Sensitivity

This refers to the sensitivity level that the Aircraft will sense and follow the terrain



Spray Parameter

Open Spray Parameters and confirm:

1. Dosage (L/ha)

This refers to the volume of dosage per ha

2. Spray Width (m)

This setting will allows operator to adjust the spray width during spray operation

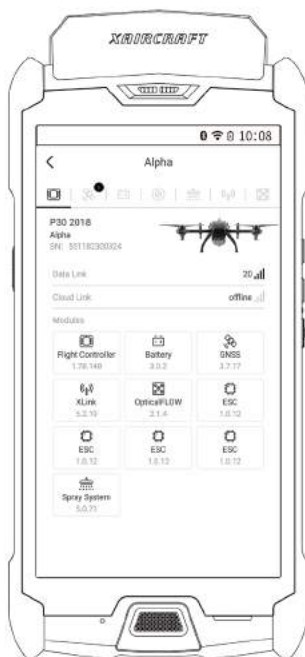
3. Atomization

Level	RPM	2017 Model	2018 Model
1	1000		550 um
2	2000		285 um
3	3000	235 um	200 um
4	4000	195 um	165 um
5	5000	165 um	150 um
6	6000	150 um	135 um
7	7000	140 um	125 um
8	8000	125 um	120 um
9	9000	120 um	115 um
10	10000	115 um	110 um
11	11000	110 um	105 um
12	12000	105 um	100 um
13	13000	100 um	95 um
14	14000	95 um	95 um
15	15000	95 um	90 um

Aircraft Status

Prior to beginning any aircraft operations, it is necessary to undertake a pre-flight check of the aircraft. The following is a pre-flight checklist that had been recommended by XAG prior to any operation.

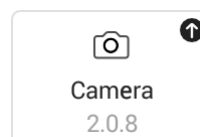
- ▶ Inspect the aircraft status by selecting the Aircraft Icon.

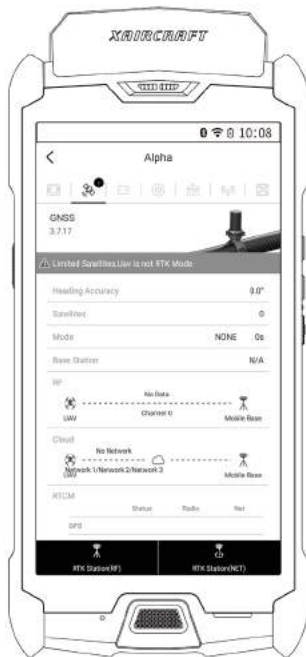


UAV Overall Status

This interface provides basic information about the status of individual Component and its version.

- ▶ If there is any module requires update, there would a Green ↑ icon on the top right corner.





GNSS RTK Module

Open GNSS RTK Module and confirm:

1. GNSS RTK is successfully connected and appear as “Normal”
2. Ensure there are sufficient Satellites for RTK (GPS satellites is ≥ 10 , and stable)



Battery Module

Open Battery Module and confirm:

1. Remaining Battery (SOC) is $\geq 30\%$
2. Ensure there are sufficient Battery for your Task



Propulsion Module

Open Propulsion Module and perform Motor Test:

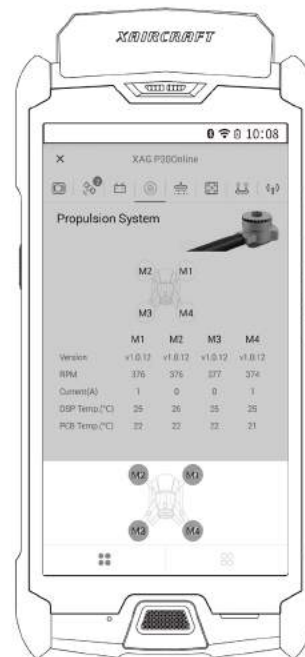
1. Select "Test"
2. Operators can Test the Motor by selecting the specific Motor or Test All Motor simultaneously

WARNING

Please stand clear from Aircraft during Motor Testing



Testing Individual Motors



Testing All Motors



Spray System Module

Open Propulsion Module and perform Motor Test:

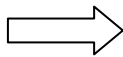
1. Select "Auto Check"
2. Follow the On-screen instruction and perform the system check on Spray System. If there are any problems listed, please perform additional manual check and replace the parts required.

WARNING

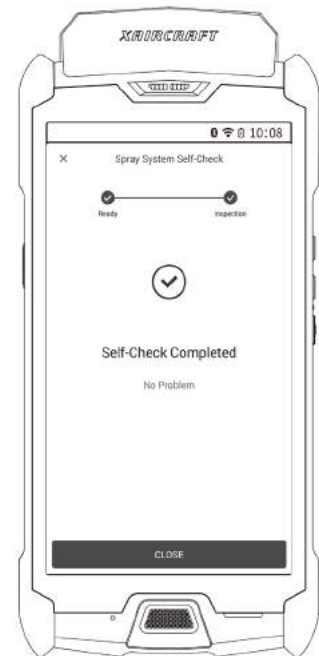
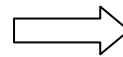
DO NOT USE chemical for Spray System Testing



Self-Check Preparation



Self-Check in Progress



Testing Result



Data Link Module

This interface provides basic information about the status of Data Link between the Aircraft and the A2 Pilot Phone.



Terrain Tracing Module

This interface provides basic information about the Status of Terrain Tracing Component,

Confirm the Status is "OKAY"

Intelligence AB Mode

Intelligence Mode allows the P-Series UAV to automatically perform the Standard pattern mode.

Please follow the below instructions to Preset the Intelligence AB Mode.

1. Enter Manual Mode
2. Long Press button "A/L" to record Point A
3. Long Press button "B/R" to record Point B
4. Long Press Operation Mode Button to enter Intelligence Mode
5. After entering Intelligence Mode, Operation Mode Button LED will quick flash, Select either
 - i. A/L Button
Aircraft will being Operation from the Right to Left (See Figure A)
 - ii. B/R Button
Aircraft will being Operation from the Left to Right (See Figure B)



Operating the joystick in Intelligent mode will cause the aircraft to enter manual mode.

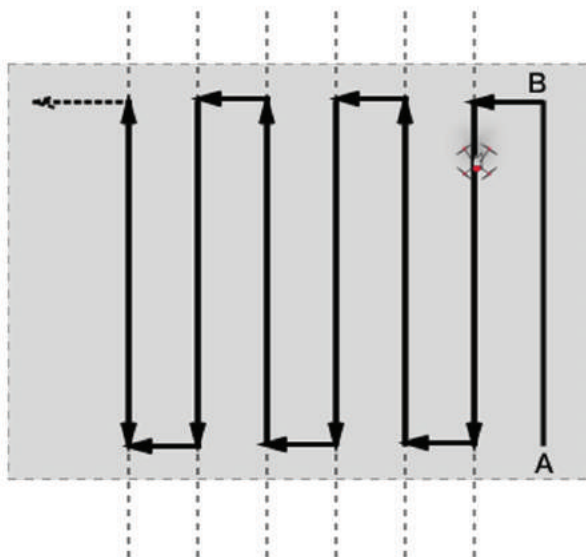
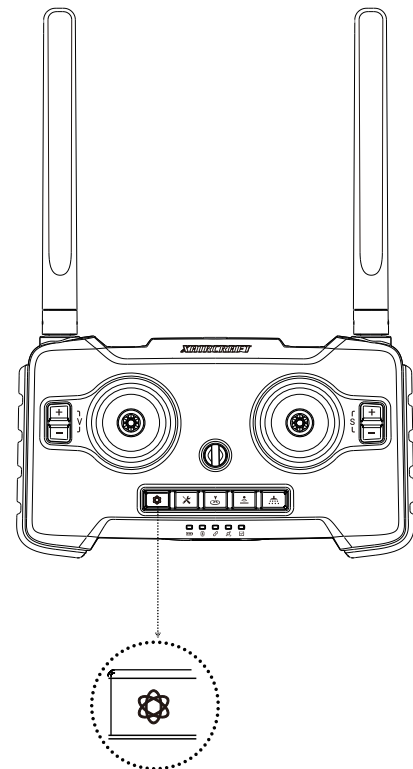


Figure A

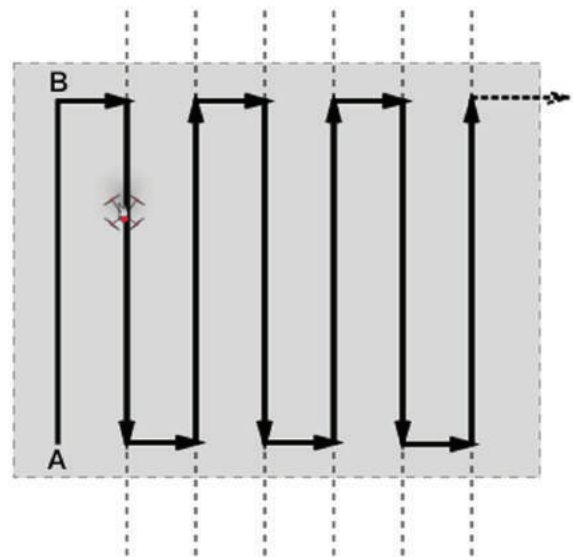


Figure B

Appendix

Specifications

900 MHz

Operation Frequency Range	915-920 Mhz
Transmitter Power	1W
Maximum Transmission Distance	2KM

Bluetooth

Protocol	4.0BLE
Operation Frequency Range	2.402-2.480GHz
Transmitter Power	6mW

General

Battery	18650*2 2s1p
Charge Type	Support QC3.0 fast charge protocol and BC Protocol Max input 13.5w (9V, 1.5A)
Rated Power	7.6V 2600mAh
Storage Capacity	32Mb
Charge Time	40min in QC Mode
Working Time	8 hours
Operation Temperature Range	-20 °C – 60 °C
Storage Temperature Range	-20 °C – 60 °C
Charging Temperature Range	0 °C – 45 °C
Supported Aircraft Models	P10 Plant Protection UAS P20 Plant Protection UAS P30 Plant Protection UAS
GNSS	GPS + GLONASS + BeiDou
Dimensions	171mm*105mm*74mm
Weight	432g

Language Adjustment

1. Connect ARC1 Agricultural Remote Controller to a computer via USB Type-C cable enclosed with the purchase of the ARC1. ARC1's USB Port is located at the bottom of the ARC1 Battery status light will be in purple to indicate a success in connection
2. Copy the file Language files (For example: ARC1_release_v1.1.3.fw) into the ARC1's internal storage window.
3. After transfer is completed, safely remove and disconnect ARC1 from your computer and power on the ARC1.
4. Language update process will automatically begin, the Battery Status indicator will flash in Red, Blue, Green and purple.
5. Completion of the update process will automatically power off the ARC1.
6. Power on the ARC1 again and confirm the battery status indicator light should be in green and the process of Language change is now complete.

The content of this Manual are subject to change

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If you have any question about this document, please contact your supplier or contact us by sending an enquiry in the following method:

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E: Info@xagaaustralia.com.au

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